

INEEL REPORTER

A closer look at environmental management at the INEEL

September
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Study Sheds Light on Cleaning Contaminated Soils

A new system for separating soil was tested by researchers at the Idaho National Engineering and Environmental Laboratory. Although this effort didn't produce the expected results, the study offered several successes that can be used at other Department of Energy facilities and on future cleanup work.

An Idaho National Engineering and Environmental Laboratory study that tested a new system for separating soil is offering valuable information that will affect cleanup work.

Researchers hoped the soil separation system — or segmented gate system — could reduce the volume of contaminated soils required for disposal at selected INEEL sites.

Although this effort didn't produce the expected results, the study offered several successes that can be used at other Department of Energy facilities and on future cleanup work, or remediation, at the Central Facilities Area.

The study was performed in May and June at the Auxiliary Reactor Area-23 site which is part of Waste Area Group 5. ARA-23 includes about 58 acres (50,000 cubic yards) of wind-blown contamination, mainly cesium-137, which was produced by the Stationary Low-Power Reactor accident in 1961. The segmented gate system was demonstrated on 340 yards of soil.

The researchers wanted to see if the segmented gate system could reduce the volume of contaminated soils and clean the area. They set a cleanup goal of 23 picocuries per gram (pCi/g) of cesium-137, which is the minimum required level for safe residential use 100 years from now.

To begin, researchers created a map of the contaminated soil. First, they drove over the contaminated soil in a four-wheel drive vehicle with a global positioning radiometric scanner system mounted on the front. As the system scanned the soil, a computer in the vehicle mapped the contamination.

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Contributing Writers

Kristen Akins Burns
526-7225, burnka@inel.gov

Stacey Francis
526-0075, syf@inel.gov

John Howze
526-6864, jhowze@inel.gov

Erik Simpson
526-4700, eas@inel.gov

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Construction equipment then removed three inches of topsoil (the most contaminated part) and hauled the soils to be separated in the segmented gate system. After the segmented gate system separated the soil, researchers drove the vehicle across the site again to create a second map to make sure the contamination was completely removed. The process was repeated until the area was cleaned.

With the segmented gate system, soil passes through an arrangement of conveyer belts, radiation detectors and segmented gates that detects and separates radioactive soil from clean soil.

If the system had worked as planned, contaminated soils above the “threshold” goal would have been automatically separated by the gates and dropped into a “dirty” pile and the non-contaminated soil would go into a “clean” pile.



Although the segmented gate system effectively separated soil contaminates above 110 pCi/g, separation was not effective at the desired level.

This was the first time the segmented gate system was used for wind-blown radionuclide-contaminated soils. Previous studies at other DOE sites used chunks of contamination, like depleted uranium. But at the INEEL, the segmented gate system had a difficult time separating the soils.

Although the segmented gate system effectively separated soil contaminates above 110 pCi/g – which is acceptable for industrial standards – separation was not effective at the desired level.

Rain and mud also contributed to difficulties. The wet environment helped with dust control, but wasn't optimum for stockpiling and loading material into the segmented gate system unit.

The INEEL was the first to use the global positioning radiometric scanner system to verify that an area is clean after excavation. In the past, researchers took several samples by hand, sent the material out for analysis and waited for results. Using the global positioning radiometric scanner system, only a few samples were required.

In addition, the results were instant because of the real-time maps, and the global positioning radiometric scanner system was able to meet the required cleanup goals.

The study verified that the global positioning radiometric scanner system survey correlated well with radiation measurements taken by the SGS unit. Conventional construction equipment normally removes six inches of soil. The study showed that the majority of contaminated soil is contained in the top three inches.

Second Shipment of Transuranic Waste Hits the Road

A second shipment of transuranic waste left the INEEL on August 23, 1999 destined for permanent disposal at the Waste Isolation Pilot Plant near Carlsbad, New Mexico. The shipment contained 28 drums of radioactive waste.

The crowd was much smaller as the second transuranic waste shipment pulled out of the Radioactive Waste Management Complex on Aug. 23, 1999. Approximately 15 people were on hand as 28 drums inside a TRUPACT-II shipping cask hit the highway for the 36-hour trip to the Waste Isolation Pilot Plant in New Mexico.

Getting the second shipment out the door was not an easy task for the INEEL. During an audit by the Carlsbad Area Office in May, the audit team found 21 areas within the INEEL's Transuranic Waste Program that were not in compliance with the procedures and the site's certification was allowed to lapse while corrective actions were put into place.

Eight of the items were deemed 'critical' and had to be closed before the INEEL was allowed to make another shipment to the WIPP. These eight, and one other finding that came up during the closure process, were closed late in the afternoon on Friday, August 20 and the final steps were taken to get the shipment on the road.



The recent audit findings were primarily procedural in nature, meaning the established procedures – as written – weren't adequate or needed fine-tuning. The accuracy and quality of the characterization data itself was confirmed by the audit to meet all requirements. The eight critical audit findings included transportation checklists not being marked properly, forms being incomplete or parts missing and reports not being forwarded in the prescribed amount of time. None of the audit findings compromised the safety of the first INEEL shipment.

The 28 drums in the shipment contained non-mixed transuranic waste. Non-mixed transuranic waste consists of disposable items – like clothing, tools, rags and debris – contaminated with radioactive elements. The waste is not contaminated with chemicals – like cleaning solvents or lead – that would cause it to be regulated under the Resource Conservation and Recovery Act.

Continued transuranic waste shipments are key to meeting terms of the October 1995 agreement among the state of Idaho, the U.S. Navy and the DOE to remove 15,000 drum equivalents of transuranic waste from the INEEL by the end of 2002.



More Information

For more information about environmental management at the INEEL, visit their webpage at:



Four Data Collection Studies Being Conducted at the INEEL

This summer, four characterization investigations were done throughout Waste Area Group 10 at the INEEL. These investigations evaluated the impact of contaminate releases on INEEL plants and animal species

More Information

For more information or to request a briefing or a tour about Environmental Management at the INEEL call:

1-800-708-2680

Waste Area Group 10 is responsible for safely evaluating and remediating past contaminant releases in all areas outside facility fences at the INEEL. This responsibility includes evaluation of old reactor sites such as the Organic Moderator Reactor Experiment site and the Security Training Facility, evaluation of ordnance releases, and evaluation of the impact of contaminant releases on INEEL plant and animal species.

Four characterization efforts this summer supported the four assessment areas that make up WAG 10. These assessment areas are the site-wide groundwater assessment, the site-wide ecological assessment, the site-wide ordnance assessment, and the assessment of miscellaneous soil release sites located throughout the INEEL. The site-wide groundwater assessment seeks to identify and evaluate areas of contaminant plume overlap in the aquifer beneath the INEEL. The site-wide ecological assessment seeks to evaluate the impacts of past contaminant releases on environmental receptors, such as plants and animals. The ordnance assessment focuses on identifying and remediating areas of the INEEL that are contaminated with unexploded ordnance. Finally, the miscellaneous release site assessment seeks to identify remedial alternatives for the WAG 10 soil release sites, such as the Organic Moderator Reactor Experiment pond.

Characterizations that took place this summer included:

1. Sampling of wild onions to assay them for contamination uptake. The results of this sampling will be provided to the local Native American tribes, who use wild onions as a food source.
2. Sampling of 10 ordnance sites to determine the average concentration of explosive compounds in INEEL soils. Pieces of unexploded ordnance have already been removed from these sites; this sampling will help determine the amount of any contamination resulting from broken or shattered ordnance that remains at the sites.
3. A treatability study examined biodegradation of explosive compounds. The process takes soil containing TNT or RDX chunks, adds acetone to dissolve the chunks, and mixes the acetone slurry with traditional composting materials: cow and chicken manure, potato waste, and wood chips. The process is expected to completely break down all the TNT, RDX, and acetone.
4. Workers have drilled nearly 50 exploration holes to characterize contaminants at the OMRE pond site. The pond was used in the 1960s and 1970s to dispose large volumes of organic liquids. Characterization sought to determine contaminant levels in three areas: near-surface soil, the vadose zone and the aquifer beneath the pond.

INEEL Demolishes Facility Using Explosive Charges

The Security Training Facility was demolished using explosive charges on Sept. 18. This is the 215th building or structure demolished at the INEEL since 1975.

Using explosive charges set by experts, demolition crews brought down the Security Training Facility at the Department of Energy's Idaho National Engineering and Environmental Laboratory desert site Sept. 18. It was the 215th building or structure demolished at the site since 1975.

No radiological contamination was associated with the building, and asbestos was removed before the demolition was carried out by INEEL's decontamination and decommissioning program. Useful material in the building, such as stainless steel and iron products and a large water boiler, were recovered for salvage or sale as excess material before the demolition.

Explosives were used to cut the structural steel supporting the building, allowing it to tip over in a controlled fall. Demolition officials said the destruction was not an implosion often seen in which explosive charges cause a building to collapse in on itself.

The facility was originally built as the Experimental Organically Cooled Reactor, but it was never completed and its reactor core was never loaded with fuel. Intended to demonstrate reactor cooling using paraffin wax, a petroleum product resembling white liquid furniture wax, construction of the facility was stopped in 1962 when it was about 90 percent complete. A similar test reactor became operational in Canada to demonstrate the technology, making the INEEL's project unnecessary.

For many years, the building was used for storage until it was converted to the Security Training Facility in 1984. Here, INEEL security personnel carried out intensive training for hostage control, anti-terrorism tactics and nuclear proliferation responses. The building's deep corridors, vacant offices and high staircases provided an ideal environment for real-life security responses.

The facility was the scene of one tragedy in 1986 when INEEL security officer Brett Landon was killed from the accidental discharge of a pistol that another officer dropped on the locker room floor.

Security training at the STF continued until 1997 when the building was put on the list for demolition. Security training is now conducted at the site's firing range, at an unused fire training tower and through computer simulation. ▼





Briefly

- ▶ **The U.S. Department of Energy, U.S. Environmental Protection Agency and state of Idaho are scheduled to sign a Record of Decision in late September for cleanup of the Idaho Nuclear Technology and Engineering Center (formerly the Idaho Chemical Processing Plant or Chem Plant).** The agencies completed a comprehensive remedial investigation/feasibility study for INTEC in 1998. A proposed plan was issued in October of that year and public meetings occurred in November. The INTEC facility, which began operations in 1952, reprocessed defense-related spent nuclear fuel until 1992. Liquid wastes generated from this activity were stored in an underground tank farm until they were treated using a calcining process, which converts the liquid to a more stable granular form. The current mission of INTEC is to receive and temporarily store spent nuclear fuel and radioactive waste for future disposition, manage waste and clean up past contamination. Forty areas in and near the facility will require cleanup actions to reduce the risk to human health and the environment. These areas principally involve contaminated soils, groundwater and “perched” water, which is water that is suspended between sedimentary interbeds.
- ▶ **Carolyn L. Huntoon was sworn in July 13 as Assistant Secretary for the Department of Energy’s Office of Environmental Management.** She was confirmed by the United States Senate on July 1. Huntoon will oversee the Department’s cleanup of the nation’s nuclear weapons complex and other DOE cleanup sites; and manage the almost \$6 billion EM budget. Additionally, under a departmental reorganization announced April 21 by Energy Secretary Bill Richardson, site managers for DOE’s Idaho, Savannah River and Richland operations offices, its Ohio and Rocky Flats field offices and the Director of Richland’s Office of River Protection will report directly to Huntoon. During her confirmation hearings, Huntoon stressed that improving project management and ensuring the health and safety of workers, the public and the environment are two critical elements in her strategy for directing the cleanup of thousands of tons of nuclear and hazardous waste.
- ▶ **Citizens have until Oct. 4 to submit comments on the proposed plan for the Central Facilities Area.** DOE, EPA and the state of Idaho extended the comment period 30 days – from Sept. 4 – at the request of the public. The Central Facilities Area was constructed in the 1940s and 1950s to house U.S. Naval Gunnery Range personnel and later the National Reactor Testing Station, the former name of what is now the INEEL. Over the years, the complex has been modified to fit the changing needs of the INEEL. The complex provides centralized support services for INEEL contractors and the DOE and includes some 80 buildings and structures, such as research laboratories, emergency services and craft shops. In 1999, a comprehensive environmental investigation for the complex was completed and three contaminated soil sites requiring cleanup were identified. Cleanup is proposed for the sites to protect human health and the environment. The three sites that require cleanup are: a waste disposal pond, a sewage treatment plant drainfield and a transformer yard.
- ▶ **Three fact sheets are available from the Community Relations Plan office on various remediation projects.** For those who are not on the fact sheet mailing list and would like copies, please call (208) 526-4700 or the INEEL’s toll-free number at (800) 708-2680. The fact sheets discuss (1) the Test Area North groundwater bioremediation successes (four pages in length), (2) upcoming treatability studies at the Radioactive Waste Management Complex (four pages), and (3) the comprehensive investigation for Waste Area Group 10 (eight pages), which involves the Snake River Plain Aquifer and miscellaneous areas at the INEEL not addressed by other waste area groups.

Get Involved

Citizens are encouraged to get involved in decision-making at the INEEL by reviewing and commenting on documents, attending public meetings, and requesting briefings or tours. Information about these public involvement activities can be obtained through:

Target Mailing Lists

Mailing lists are continually updated so interested citizens and groups can automatically receive general or specific INEEL information (electronically or through U.S. Mail). You can be added to mailing lists by calling the INEEL toll-free number.



Toll-Free Phone Number

To obtain specific documents or other information, request a speaker or briefing on a particular topic, inquire about public meetings or public comment periods, or schedule a tour of INEEL, call the INEEL toll-free number at 1 (800) 708-2680.



Videos/Instructional Materials

Videos and brochures are available on a variety of subjects including the Snake River Plain Aquifer, waste management, and general INEEL history. To request these items, call the INEEL toll-free number.



Internet

The INEEL Home Page is available at <http://www.inel.gov>. Specific INEEL environmental information is available at <http://environment.inel.gov>. The INEEL Administrative Record is available at <http://ar.inel.gov/home.html>.



Information Repositories

DOE maintains three information repositories throughout Idaho. The Boise State University repository will be available in October. Information repositories are collections of documents that provide detail and backup information on INEEL cleanup projects.



INEEL Technical Library
DOE Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415

Albertson Library
Boise State University
1910 University Drive
Boise, ID 83725

University of Idaho Library
University of Idaho Campus
434 2nd Street
Moscow, ID 83843

INEEL Idaho Falls Office

The INEEL Community Relations Office is located in Idaho Falls and can provide information and briefings on environmental management topics. Call the INEEL Community Relations Plan Coordinator, Erik Simpson, at (208) 526-4700, or call the INEEL toll-free number.



INEEL Boise Regional Office

An INEEL Regional Office is located in Boise to provide information and other resources for those living in the western portion of the state. The office is located at 805 West Idaho Street, Suite 301, Boise, Idaho 83702, or call 208-334-9572.





Calendar

October

- ▶ 4 Central Facilities Area (WAG 4) proposed plan comment period ends

November

- ▶ INEEL High-Level Waste and Facilities Disposition Draft Environmental Impact Statement expected to be issued for public comment



INEEL
IDAHO NATIONAL ENGINEERING & ENVIRONMENTAL LABORATORY

Environmental Management Program
P.O. Box 1625 MS 3911
Idaho Falls, ID 83415-3911

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